

ABSTRACT OF DISCLOSURE

A position-sense interface with improved transfer characteristics. Electrical position detection circuitry, which may be substantially time-multiplexed or frequency-multiplexed, comprises a differential charge integrator with input-sensed output-driven common mode feedback. By
5 placing sense capacitors in the feedback loop of said differential charge integrator with input-sensed output-driven common mode feedback, improved position sensing linearity is attained. In some embodiments of the invention, a compensating charge is applied to the sense capacitors in a fashion that minimizes the output common mode shift of the opamp. The
10 magnitude of the compensating charge may be preset at a substantially constant level, or derived by a feedback loop that measures the shift in output common mode voltage in response to an excitation signal and adjusts the magnitude of the compensating charge to drive said shift towards zero.

15 The invention has numerous advantages for acceleration measurement in both open-loop and force-balanced accelerometers, as well as rotation rate measurement in a vibratory rate gyroscope. Other applications in which the invention may prove advantageous include: motion detection for an oscillation-sustaining feedback loop; position detection of
20 actuators, including micro-actuators used for effecting controlled motion of a disk-drive read/write head, or effecting controlled motion of an optically active device, such as a positionable mirror for use in fiber-optic data communications; and application of electrostatic forces for large motions.